

GOLD CUP[®] **P/M6-7-8 Fixed Displacement** Spare Parts and Exploded Views

HY28-2681-03/GC/US Effective: April 2023



ENGINEERING YOUR SUCCESS.

Hydraulic Pump Division and Denison Hydraulics

The Hydraulic Pump Division of Parker Hannifin was formed in 2004 when our significant piston pump business was expanded through the acquisition of Denison Hydraulics. The addition of Denison allowed us to marry the wealth of knowledge that both companies have in the design, manufacture, and application of piston products in both open circuit and closed circuit system applications. Since before WWII, Denison products have been chosen for Military test stand applications and for shipboard hydraulic applications being recognized as technology leaders.

The heavy duty GOLD CUP® series of pumps and motors in this catalog represent a broadening of our product offering with hydrostatic transmission applications in marine, drilling, and shredding applications, among others. The tried and true design of the GOLD CUP® product line incorporates features such as integral servo and replenishing pump, hot oil shuttle, and a unique servo control system; all of which combine to provide a rugged self contained package which can withstand the harshest of conditions and continue to perform with trouble free long life.

The division is a leading worldwide manufacturer of hydraulic components and systems for earthmoving and construction vehicles; for mining equipment; for pulp and paper, chemical and other processing equipment; for ships and ordnance equipment; and for such in-plant machines as machine tools, plastic molding, die casters, and stamping presses.



The product information, specifications, and descriptions contained in this publication have been compiled for the use and convenience of our customers from information furnished by the manufacturer; and we can not, and do not, accept any responsibility for the accuracy or correctness of any description, calculation, specification, or information contained herein. No such description, calculation, specification, or information regarding the products being sold has been made part of the basis of the bargain, nor has same created or amounted to an express warranty that the products would conform thereto. We are selling the goods and merchandise illustrated and described on this publication on an "as is" basis, and disclaim any implied warranty, including any warranty of merchantability or warranty of fitness for any particular purpose whatsoever, with respect to the goods and merchandise sold. All manufacturer warranties shall be passed on to our customers, but we shall not be responsible for special, indirect, incidental, or consequential damages resulting from the use of any of the products or information contained or described on this publication. Further, we reserve the right to revise or otherwise make product improvements at any time without notification.



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This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

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The items described in this document are hereby offered for sale by Parker-Hannifin Corporation, its subsidiaries or its authorized distributor. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document.

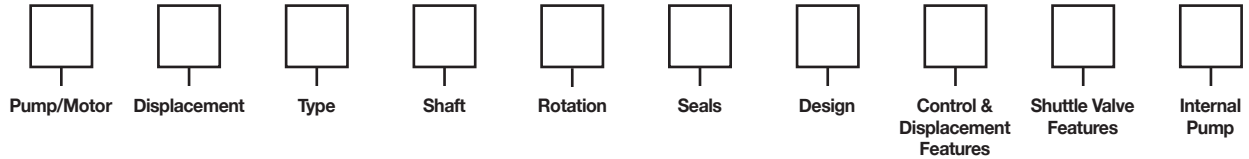
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Notes:

1. Parts list and associated drawings shown in this bulletin are for standard variable volume model pump and motors only. All documentation for special "M2" modification model numbers must be verified with HPD Factory Representative prior to ordering parts for such products.
2. * Indicates Special Instructions or Considerations.
3. ** Indicates Common Parts.
4. N/A Indicates Not Available or Not Applicable.
5. All documentation represented in this bulletin is for standard production models only, (as follows):
 - 5.1. Pump/Motor-6 = Design Level "D"**
 - 5.2. Pump/Motor-7 = Design Level "D"**
 - 5.3. Pump/Motor-8 = Design Level "D"**
6. See ordering code for configuration options.
7. All orientation references are described when viewing unit from main drive shaft.
8. Assembly part numbers with -0 suffixes, indicate Buna N (Nitrile) seal compound. For Ethylene Propylene, (EPR), compound, use -4 suffix. For Fluorocarbon compound use -5 suffixes.
9. Detail part numbers for O-rings with 671/691 prefix, indicates Buna N (Nitrile) seal compound. For Ethylene Propylene, (EPR), compound, use -4 suffix. For Fluorocarbon compound, use -5 suffixes.
10. Drawings with items marked with double balloons "◎", indicate assemblies.





Code	Pump/Motor
P	Pump
M	Motor

Code	Displacement
6	6.00 in ³ /rev (98cc/rev)
7	7.25 in ³ /rev (119 cc/rev)
8	8.00 in ³ /rev (131 cc/rev)

Code	Type
F	Fixed Displacement
G	Fixed Displacement with Shuttle Package (Motors only)
M	Fixed Displacement with Thru-Drive
N	Fixed Displacement with Thru-Drive & Shuttle Package (Motors only)

Code	Shaft
2	Keyed SAE – Mechanical Shaft Seal
3	Splined SAE – Mechanical Shaft Seal
4	Keyed SAE-D Single Lip Shaft Seal
5	Splined SAE- Single Lip Shaft Seal

Code	Rotation
R	Clockwise (Pumps only)
L	Counterclockwise (Pumps only)
N	Bidirectional (Motors only)

Code	Seals
1	Nitrile (Buna N)
4	EPR
5	Flouorocarbon (Viton)

Design letter (assigned by manufacturer)

Control & Displacement Features			
Pump/Motor	Code	Reduced Displacement	
P*F/P*M & M*F/M*G & M*M/M*N	0	Standard cam (19-degree)	
	1	P6 with 17-degree cam {5.3 in ³ /rev. (87 cc/rev.)}	
		P7 with 17-degree cam {6.4 in ³ /rev. (105 cc/rev.)}	
		P8 with 17-degree cam {7.1 in ³ /rev. (116 cc/rev.)}	
	2	P6 with 15-degree cam {4.6 in ³ /rev. (76 cc/rev.)}	
		P7 with 15-degree cam {5.6 in ³ /rev. (92 cc/rev.)}	
		P8 with 15-degree cam {6.2 in ³ /rev. (102 cc/rev.)}	
	3	P6 with 13-degree cam {4.0 in ³ /rev. (66 cc/rev.)}	
		P7 with 13-degree cam {4.8 in ³ /rev. (79 cc/rev.)}	
		P8 with 13-degree cam {5.3 in ³ /rev. (88 cc/rev.)}	

Code	Shuttle Valve Features
Omit	None M*F (Motors only)
0	None P*F P*M M*M (Pumps & Motors only)
0	Without Orifices M*G M*N (Motors only)
2	With Orifices M*G M*N (Motors only)

Code	Internal Pump
Omit	M*F M*G M*M M*N P*F (Pumps & Motors only)
X	None P*M (Pumps only)



**External
 Drive**



**External
 Mounting**



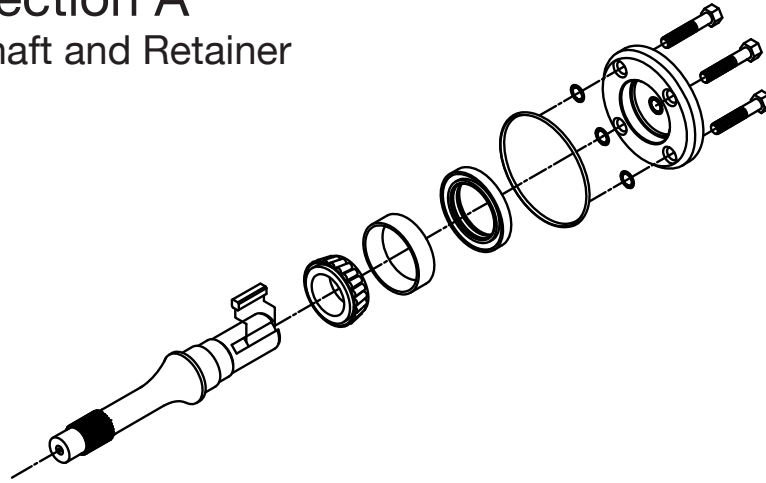
**Special
 Modifications**

Code	External Drive
Omit	None (P*F, M*F & M*G only)
M	Steel Blanking Plate Less Coupling
A	SAE-A (SAE 82-2) 6/7/8 M/N only
B	SAE-B (SAE 101-2) 6/7/8 M/N only
C	SAE-C (SAE 127-2) 6/7/8 M/N only

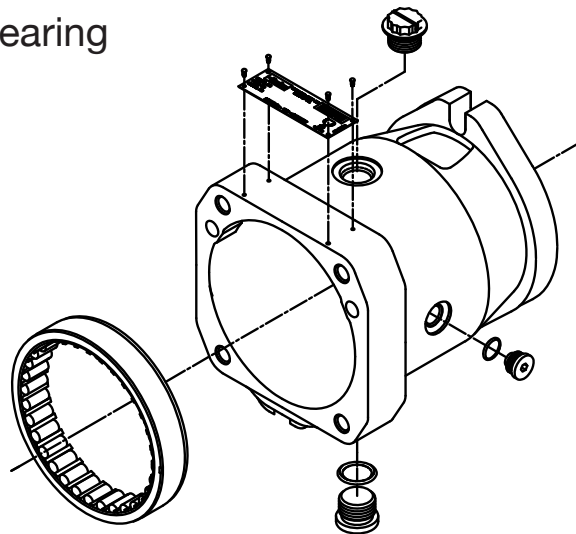
Code	External Mounting
0	No External Pump Mounted
1	External Pump Mounted (requires special modification) "M2" (must be separately specified)

Code	Special Modifications
Omit	None (Unit Painted Black)
NP	No Paint
EX	ATEX APPROVED
M2	Other Special Modification (example: tandem pumps, etc.)

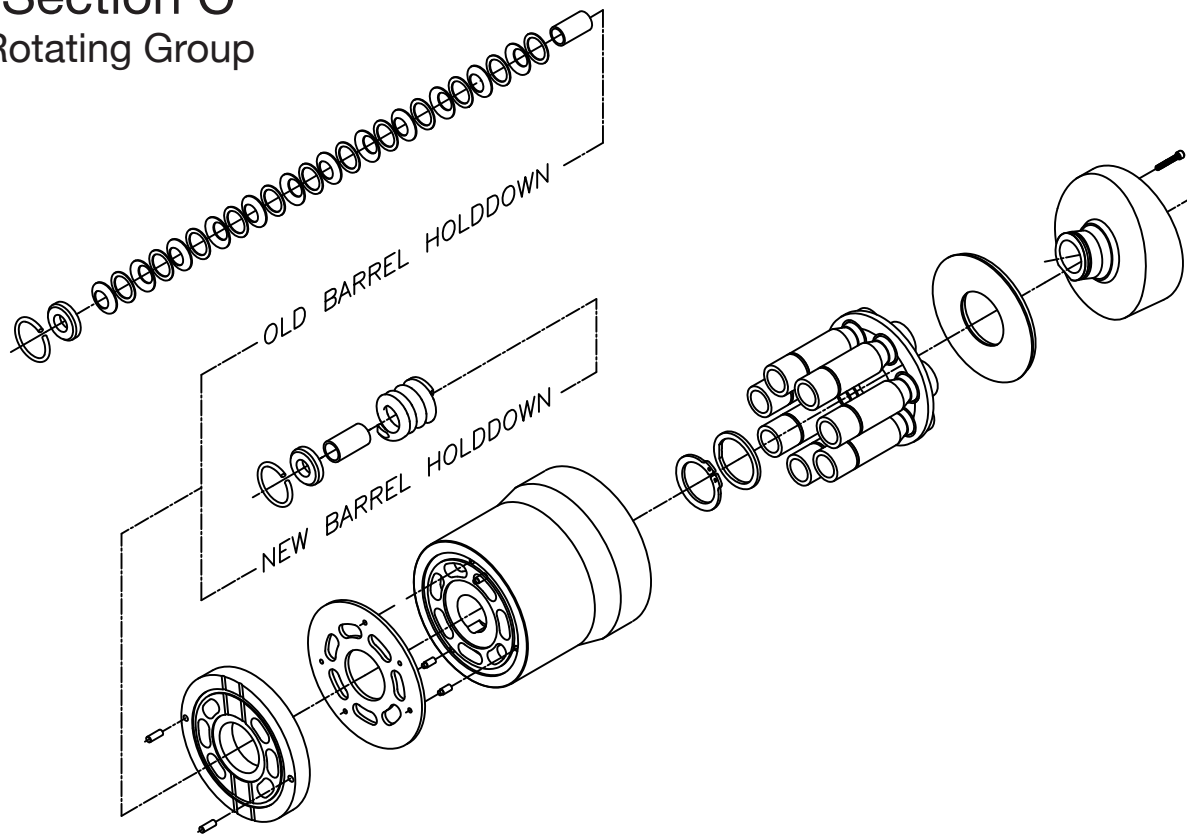
Section A Input Shaft and Retainer



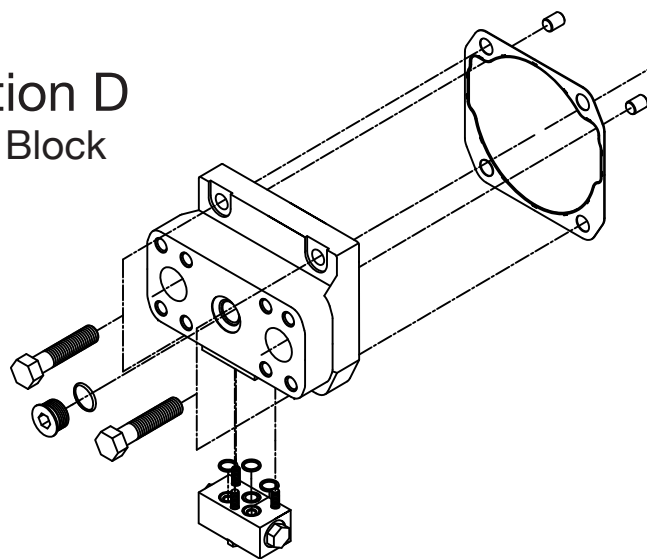
Section B Housing and Barrel Bearing



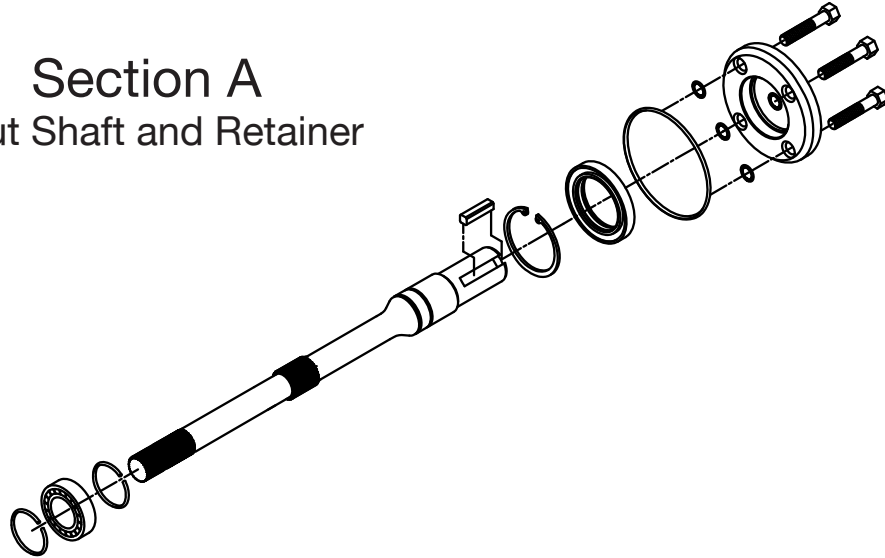
Section C Rotating Group



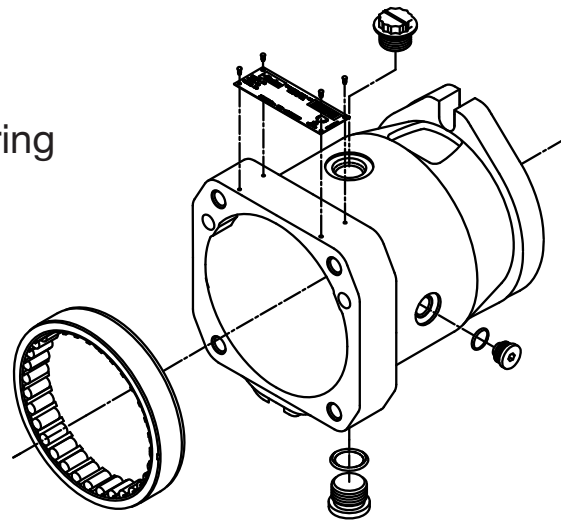
Section D Port Block



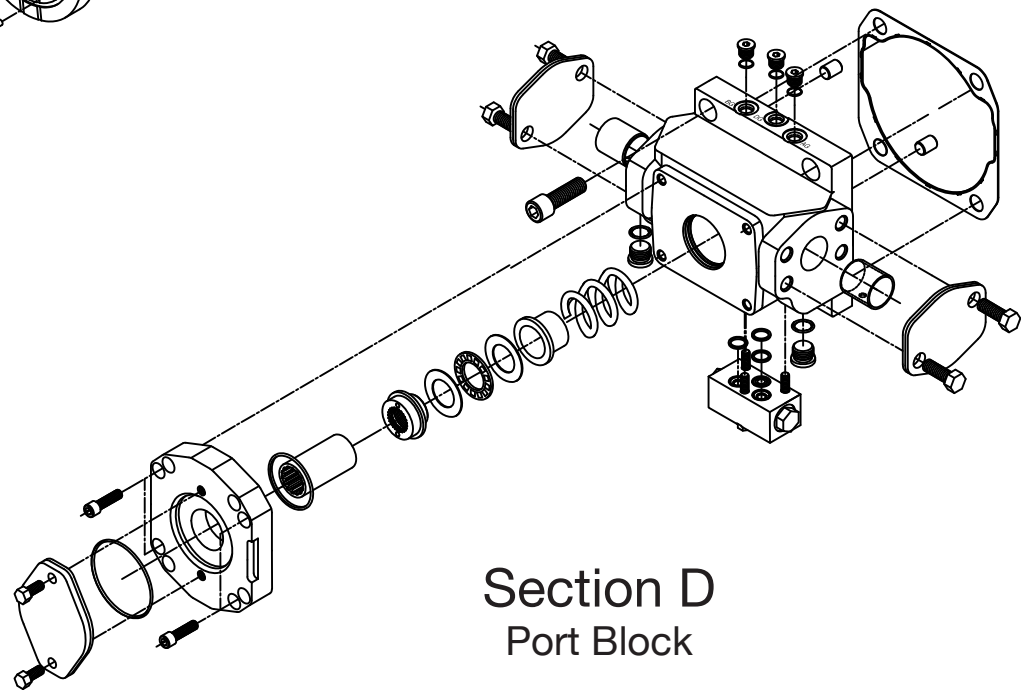
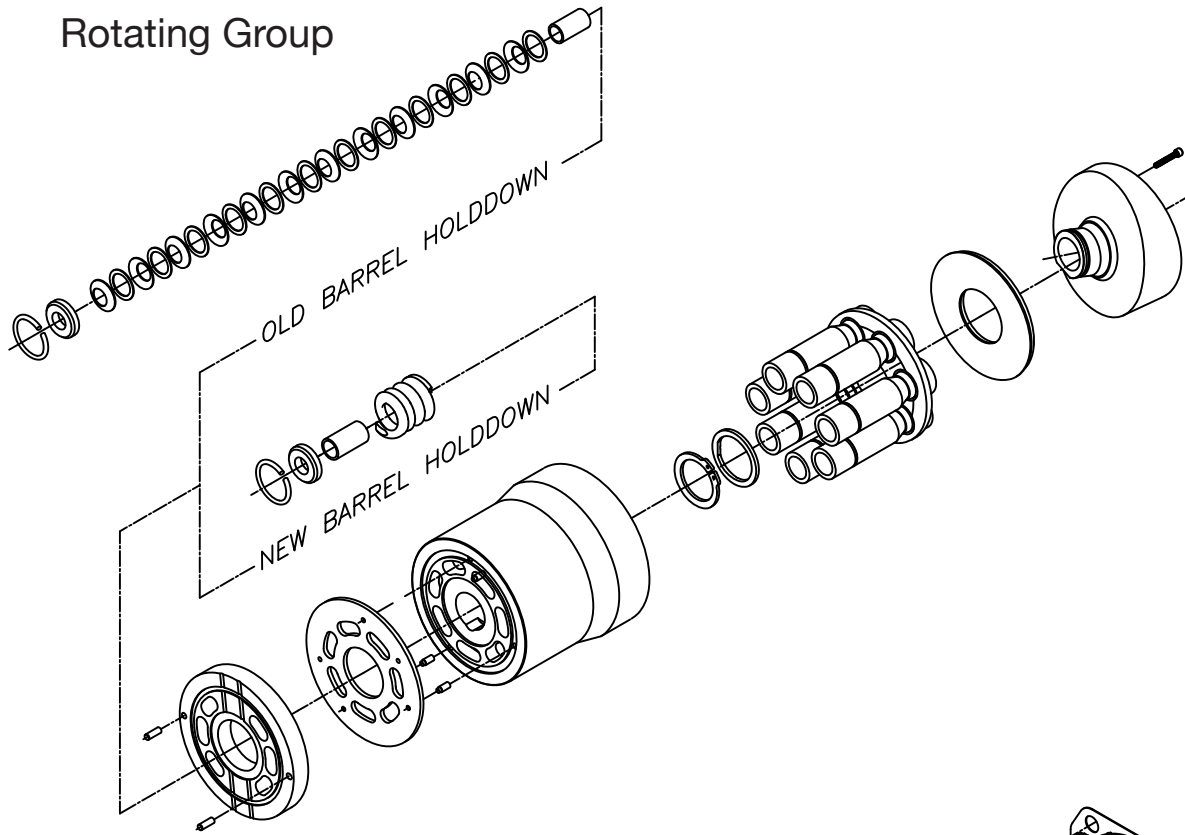
Section A
Input Shaft and Retainer



Section B
Housing and Barrel Bearing



Section C Rotating Group



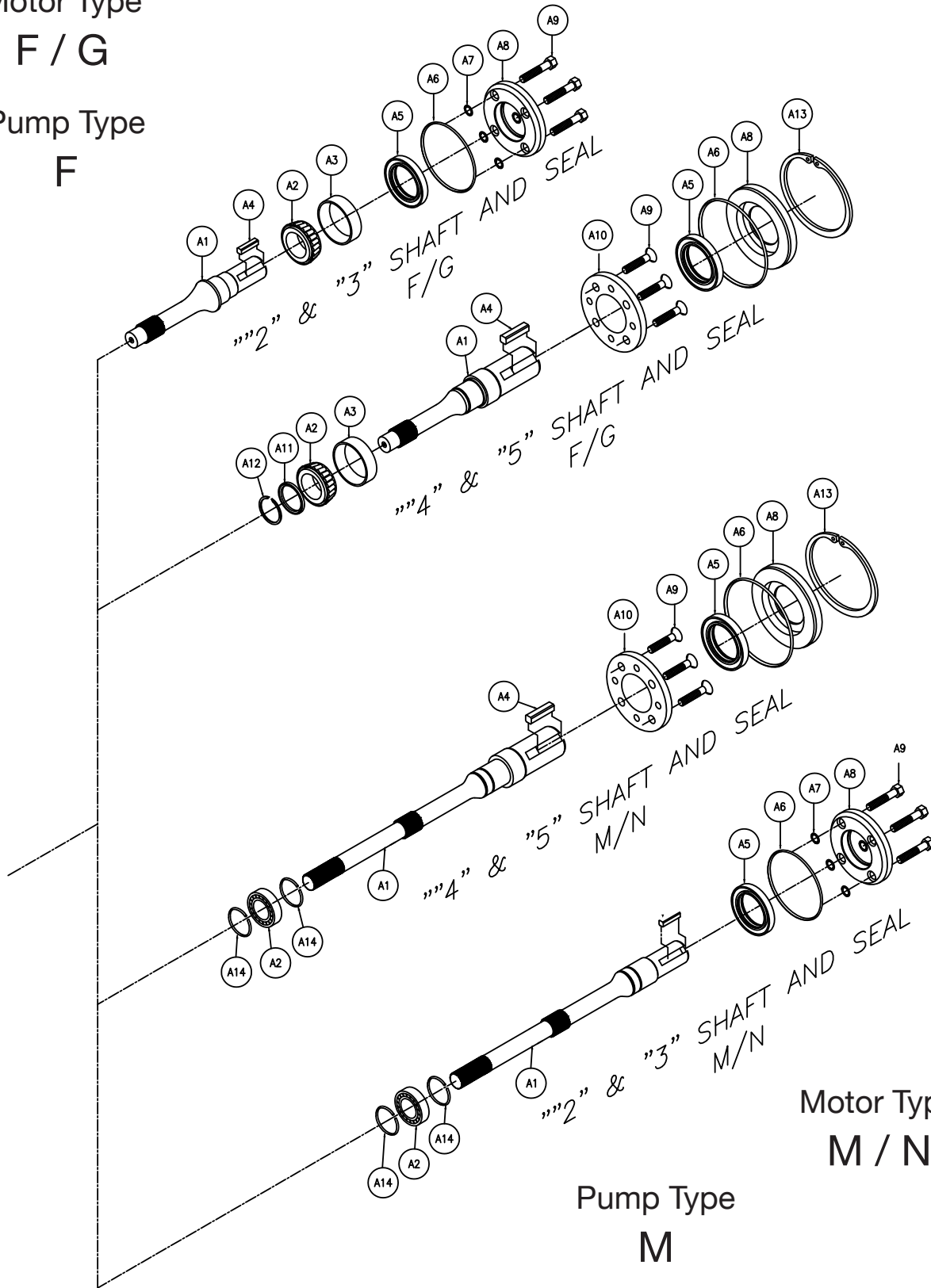
Section D Port Block

Motor Type

F / G

Pump Type

F



Motor Type

M / N

Pump Type

M

Section A P/M6-7-8 Input Shaft and Retainer Assembly								
Balloon #	Pump/Motor	Type	Shaft Code	Mounting SAE-	Seal Code	Item #	Description	Qty
A1	P	F	2	C-2 BOLT	**	033-59989-0	SHAFT KEYED SAE-C	1
	M	F/G						
	P	F	3	C-2 BOLT	**	033-57233-0	SHAFT SPLINED SAE-C	
	M	F/G						
	P	F	4	D-4 BOLT	**	033-92285-0	SHAFT KEYED SAE-D	
	M	F/G						
	P	F	5	D-4 BOLT	**	033-92284-0	SHAFT SPLINED SAE-D	
	M	F/G						
	P	M	2	C-2 BOLT	**	033-93708-0	SHAFT KEYED SAE-C	
	M	M/N						
	P	M	3	C-2 BOLT	**	033-93707-0	SHAFT KEYED SAE-C	
	M	M/N						
	P	M	4	D-4 BOLT	**	033-93710-0	SHAFT KEYED SAE-D	
	M	M/N						
P	M	5	D-4 BOLT	**	033-93709-0	SHAFT SPLINED SAE-D		
M	M/N							
A2	P/M	F/G	2/3/4/5	C- 2 BOLT & D-4 BOLT	**	230-82192-0	SHAFT BEARING CONE	1
A3	P/M	F/G	2/3/4/5	C- 2 BOLT & D-4 BOLT	**	230-82191-0	SHAFT BEARING CUP	1
A4	P/M	F/G	2	C-2 BOLT	**	033-71348-0	KEY	1
			4	D-4 BOLT	**	031-29899-0		
A5	P/M	M/N	2/3	C-2 BOLT	**	620-82066-0	SHAFT SEAL	1
			4/5	D-4 BOLT	**	620-82080-0		
A6	P/M	M/N	2/3	C-2 BOLT	1	671-00242-0	O RING	1
					4	674-00242-0		
					5	675-00242-0		
			4/5	D-4 BOLT	1	671-00158-0		
					4	674-00158-0		
					5	675-00158-0		
A7	P/M	F/G	2/3	C-2 BOLT	1	691-00905-0	O RING	4
					4	694-00905-0		
					5	695-00905-0		
A8	P/M	M/N	2/3	C-2 BOLT	**	033-59986-0	SEAL RETAINER	1
			4/5	D-4 BOLT	**	033-91269-0		
A9	P/M	F/G/M/N	2/3	C-2 BOLT	**	306-40225-0	HHCS 7/16 UNC x 1 3/4	4
			4/5	D-4 BOLT	**	316-18230-0	HHCS	
A10	P/M	F/G/M/N	4/5	D-4 BOLT	**	033-92289-0	RET BRG. OUTER RACE	1
A11	P/M	F/G/M/N	4/5	D-4 BOLT	**	033-91251-0	RET BRG. INNER RACE	1
A12	P/M	F/G	4/5	D-4 BOLT	**	356-65129-0	RETAINING RING	1
A13	P/M	F/G	4/5	D-4 BOLT	**	356-65130-0	RETAINING RING	1
A14	P/M	M/N	2/3/4/5	C- 2 BOLT & D-4 BOLT	**	033-70817-0	RETAINING RING	2
A15	P/M	M/N	2/3/4/5	C- 2 BOLT & D-4 BOLT	**	230-82140-0	SHAFT BEARING	1



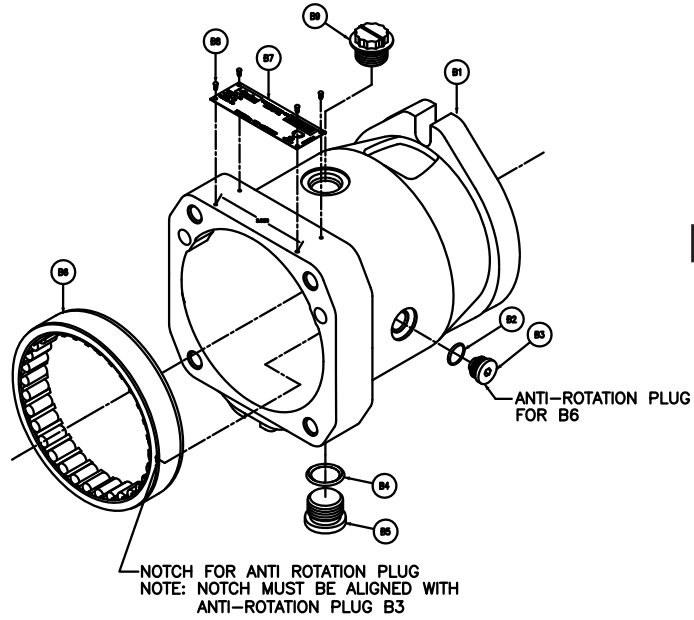
Seal Kits contain all seals for the following: 1. Main Pump/Motor – With or Without a Shuttle Valve 2. Shaft Seal				
Pump/Motor	Type	Shaft Code	Seal Code	Part Number
P/M	F/G/M/N	2/3	1	S23-03237-0
			4	S23-03237-4
			5	S23-03237-5
		4/5	1	S23-15720-0
			4	S23-15720-4
			5	S23-15720-5

Shaft Assembly - Kits The Following Kits contain Items A1, A2, A3, A4, A11, A12, A14 and A15 as applicable						
Pump/Motor	Type	Shaft Code	Rear Drive	Front Mounting	Seal Code	Part Number
P/M	F/G	2	No Rear Drive	SAE-C- 2 BOLT		S23-03261-0
		3	No Rear Drive	SAE-C- 2 BOLT		S23-03260-0
		4	No Rear Drive	SAE-D- 4 BOLT		S23-15717-0
		5	No Rear Drive	SAE-D- 4 BOLT		S23-15716-0
	M/N	2	Rear Drive	SAE-C- 2 BOLT		S23-17597-0
		3	Rear Drive	SAE-C- 2 BOLT		S23-17586-0
		4	Rear Drive	SAE-D- 4 BOLT		S23-17599-0
		5	Rear Drive	SAE-D- 4 BOLT		S23-17598-0

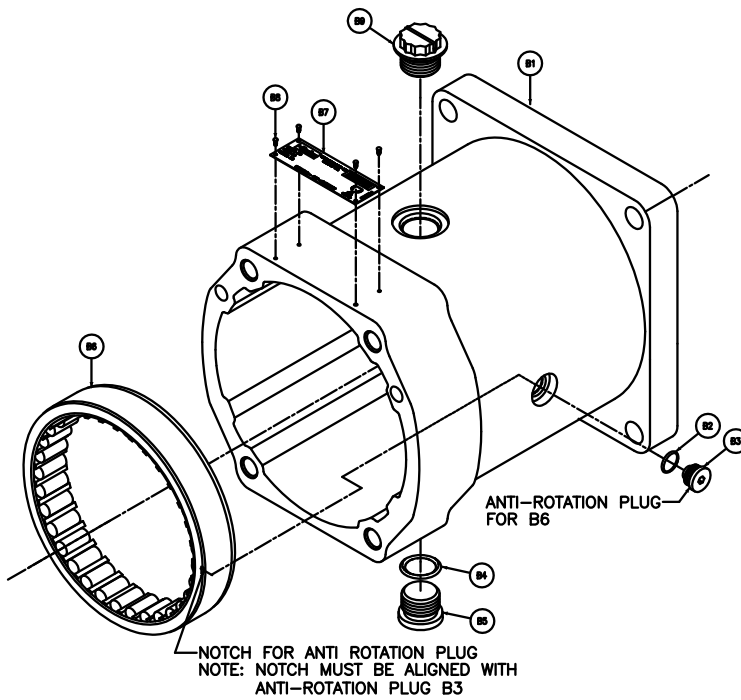
Motor Type
F / G / M / N

Pump Type
F / M

SAE-C
2 BOLT
MOUNT



SAE-D
4 BOLT
MOUNT



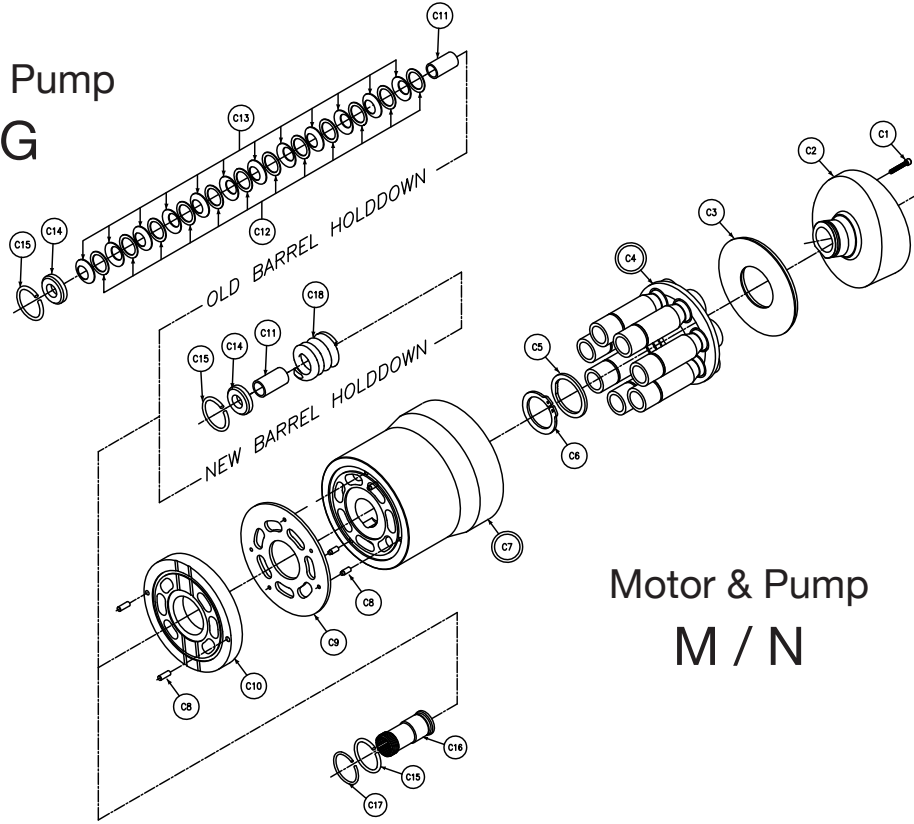
Section View - B - Housing, Barrel Bearing Assembly & Associated Kits

Section B P/M6/7/8 Housing and Barrel Bearing Assembly									
Balloon #	Pump/Motor	Type	Shaft Code	Mounting SAE-	Rotation	Seal Code	Item #	Description	Qty
B1	P/M	F/G/M/N	2/3	C -2 Bolt	N & CW	**	033-91133-0	HOUSING	1
	P/M	F/G/M/N	4/5	D -4 Bolt	N & CW	**	033-92288-0		
	P	F/M	2/3	C -2 Bolt	CCW	**	033-91069-0		
B2	P/M	F/G/M/N	2/3/4/5	C & D	**	1	691-00908-0	O RING	1
						4	694-00908-0		
						5	605-00908-0		
B3	P/M	F/G/M/N	2/3/4/5	C & D	**		033-91106-0	PLUG BRG RET	1
B4	P/M	F/G/M/N	2/3/4/5	C & D	**	1	691-00912-0	O RING	1
						4	694-00912-0		
						5	695-00912-0		
B5	P/M	F/G/M/N	2/3/4/5	C & D	**	**	488-35014-0	PLUG	1
B6	P/M	F/G/M/N	2/3/4/5	C & D	**	**	033-96167-0	BARREL BRG	1
B7	M	F/G/M/N	2/3/4/5	C & D	**	**	033-71908-0	NAMEPLATE	1
	P	F/M					033-71907-0		
B8	P/M	F/G/M/N	2/3/4/5	C & D	**	**	320-10203-0	DRIVE SCREWS	4
B9	P/M	F/G/M/N	2/3/4/5	C & D	**	**	449-00018-0	PLUG SHIPPING	1

Housing Assembly The Following Kits Contain Items B1, B2, B3, B4, B5 and B6					
Shaft Code	Pump/Motor	Type	Mounting	Rotation	Part Number
2/3/4/5	P/M	F/G/M/N	SAE-C -2 Bolt	N & CW	S23-03272-0
2/3/4/5	P/M	F/G/M/N	SAE-D -4 Bolt	N & CW	S23-15718-0
2/3/4/5	P	F/M	SAE-C -2 Bolt	CCW	S23-12719-0



Motor & Pump
F / G



Motor & Pump
M / N

Section C							
P/M6/7/8 Rotating Group Assembly							
Balloon #	Pump/Motor	Type	Code	Cam Angle = Displacement	Item #	Description	Qty
C1	P/M	F/G/M/N	**	**	358-10120-0	SHCS #10-24 UNC X 3/4	1
C2	P/M	F/G/M/N	6	19 Degree = 6.0 in ³ /rev (98cc/rev)	033-59987-0	CAM	1
				17 Degree = 5.3 in ³ /rev (87cc/rev)	033-91327-0		
				15 Degree = 4.6 in ³ /rev (76cc/rev)	033-57363-0		
				13 Degree = 4.0 in ³ /rev (66cc/rev)	033-57902-0		
			7	19 Degree = 7.25 in ³ /rev (119cc/rev)	033-59987-0		
				17 Degree = 6.4 in ³ /rev (105cc/rev)	033-91327-0		
				15 Degree = 5.6 in ³ /rev (92cc/rev)	033-57363-0		
				13 Degree = 4.8 in ³ /rev (79cc/rev)	033-57902-0		
			8	19 Degree = 8.0 in ³ /rev (131cc/rev)	033-59987-0		
				17 Degree = 7.1 in ³ /rev (1116cc/rev)	033-91327-0		
				15 Degree = 6.2 in ³ /rev (102cc/rev)	033-57363-0		
				13 Degree = 5.3 in ³ /rev (88cc/rev)	033-57902-0		
C3	P/M	F/G/M/N	**	**	033-71261-0	CREEP PLATE	1

Continued on next page.



Section View - C - Rotating Group Assembly & Associated Kits

Section C P/M6/7/8 Rotating Group Assembly							
Balloon #	Pump/Motor	Type	Displacement	Rotation	Item #	Description	Qty
C4	P/M	F/G/M/N	6.0 in ³ /rev (98cc/rev)	**	S13-43655-0	PISTONS, SHOES & RETAINER ASSY	1
			7.25 in ³ /rev (119cc/rev)	**	S13-42308-0		
			8.0 in ³ /rev (131cc/rev)	**	S21-11650-0		
C5	P/M	F/G/M/N	**	**	033-72249-0	THRUST WASHER	1
C6	P/M	F/G/M/N	**	**	033-54826-0	RET RING - .077 (1.96mm) THK BLACK	SELECT FIT ONE ONLY
	P/M	F/G/M/N	**	**	033-70490-0	RET RING - .079 (2.01mm) THK RED	
	P/M	F/G/M/N	**	**	033-70488-0	RET RING - .081 (2.06mm) THK GREEN	
	P/M	F/G/M/N	**	**	033-70484-0	RET RING - .083 (2.11mm) THK. YELLOW	
	P/M	F/G/M/N	**	**	035-72176-0	RET RING - .085 (2.16mm) THK BLUE	
	P/M	F/G/M/N	**	**	035-72175-0	RET RING - .087 (2.21mm) THK WHITE	
	P/M	F/G/M/N	**	**	033-91232-0	RET RING - .075 (1.90mm) THK ORANGE	
C7	P/M	F/G/M/N	6.0 in ³ /rev (98cc/rev)	**	S13-43957-0	CYLINDER BARREL	1
	P/M	F/G/M/N	7.25 in ³ /rev (119cc/rev)	**	S13-47511-0		
	P/M	F/G/M/N	8.0 in ³ /rev (131cc/rev)	**	S23-12718-0		
C8	P/M	F/G/M/N	**	**	033-49825-0	PIN FACE & PORT PL	5
C9	P/M	F/G/M/N	6.0 in ³ /rev (98cc/rev)	**	033-71530-0	FACE PLATE	1
			7.25 in ³ /rev (119cc/rev)	**	033-72532-0		
			8.0 in ³ /rev (131cc/rev)	**	033-72532-0		
C10	M	F/G/M/N	6.0 in ³ /rev (98cc/rev)	N	033-71531-0	PORT PLATE	1
	P	F/M		CW	031-59368-0		
				CCW	031-59333-0		
	M	F/G/M/N	7.25 in ³ /rev (119cc/rev)	N	033-53775-0		
	P	F/M		CW	031-54509-0		
				CCW	031-54508-0		
	M	F/G/M/N	8.0 in ³ /rev (131cc/rev)	N	033-92267-0		
	P	F/M		CW	031-57379-0		
				CCW	031-57372-0		
C11	M	F/G	**	**	033-59973-0	HOLDDOWN STOP	1
	P	F					
C12	M	F/G	**	**	033-59363-0	THRUST WASHER	12
	P	F					
C13	M	F/G	**	**	033-59743-0	HOLDDOWN SPRING	12
	P	F					
C14	M	F/G	**	**	033-53945-0	SPRING RETAINER	1
	P	F					
C15	P/M	F/G/M/N	**	**	033-70494-0	RETAINING RING	1
C16	M	M/N	**	**	033-57397-0	HOLDDOWN SLEEVE	1
C17	M	M/N	**	**	033-57402-0	RETAINING RING	1
	P	M					
C18	M	F/G	**	**	033-70493-0	SPRING	1
	P	F					



Section View - C - Rotating Group Assembly & Associated Kits

Rotating Group Kit "Major"					
The Following Kits Contain C3, C4, C7, C8, C9, C10 and (Barrel Bearing) Item B6					
Shaft Code	Pump/Motor	Type	Displacement	Rotation	Part Number
2/3/4/5	M	F/G/M/N	6.0 in ³ /rev (98CC/REV)	N	S23-17099-0
2/3/4/5	M	F/G/M/N	7.25 in ³ /rev (119CC/REV)	N	S23-17100-0
2/3/4/5	M	F/G/M/N	8.0 in ³ /rev (131CC/REV)	N	S23-19298-0
2/3/4/5	P	F/M	6.0 in ³ /rev (98CC/REV)	CW	S23-17093-0
				CCW	S23-17094-0
2/3/4/5	P	F/M	7.25 in ³ /rev (119CC/REV)	CW	S23-17095-0
				CCW	S23-17096-0
2/3/4/5	P	F/M	8.0 in ³ /rev (131CC/REV)	CW	S23-17097-0
				CCW	S23-17098-0

Rotating Group Kit "Minor"					
The Following Kits Contain C3, C4, C9 and C10					
Shaft Code	Pump/Motor	Type	Displacement	Rotation	Part Number
2/3/4/5	M	F/G/M/N	6.0 in ³ /rev (98CC/REV)	N	S23-17417-0
2/3/4/5	M	F/G/M/N	7.25 in ³ /rev (119CC/REV)	N	S23-17418-0
2/3/4/5	M	F/G/M/N	8.0 in ³ /rev (131CC/REV)	N	S23-19297-0
2/3/4/5	P	F/M	6.0 in ³ /rev (98CC/REV)	CW	S23-17435-0
				CCW	S23-17436-0
2/3/4/5	P	F/M	7.25 in ³ /rev (119CC/REV)	CW	S23-17437-0
				CCW	S23-17438-0
2/3/4/5	P	F/M	8.0 in ³ /rev (131CC/REV)	CW	S23-17415-0
				CCW	S23-17416-0

Retaining Ring Kit for Piston Shoe Holddown					
This Service Kit Contains one each of all part numbers in C6 above However, Individual Multiple Piece Kits (5 piece kits) are also available. See Below					
Shaft Code	Pump/Motor	Type	Seal Code	Rotation	Part Number
2/3/4/5	P/M	F/G/M/N	**	**	S23-12461-0

Retaining Ring Kit for Piston Shoe Holddown					
Individual Shoe Holddown Multiple Pack kits, (5 piece kits)					
Shaft Code	Pump/Motor	Type	QTY	Thickness / Identification	Part Number
2/3/4/5	P/M	F/G/M/N	5 Pieces	.77 (1.96mm) - BLACK	033-54826-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.079 (2.01mm) - RED	033-70490-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.081 (2.06mm) - GREEN	033-70488-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.083 (2.11mm) - YELLOW	033-70484-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.085 (2.16mm) - BLUE	033-72176-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.087 (2.21mm) - WHITE	033-72175-0K
2/3/4/5	P/M	F/G/M/N	5 Pieces	.075 (1.90mm) - ORANGE	033-91232-0K



Motor & Pump F / G

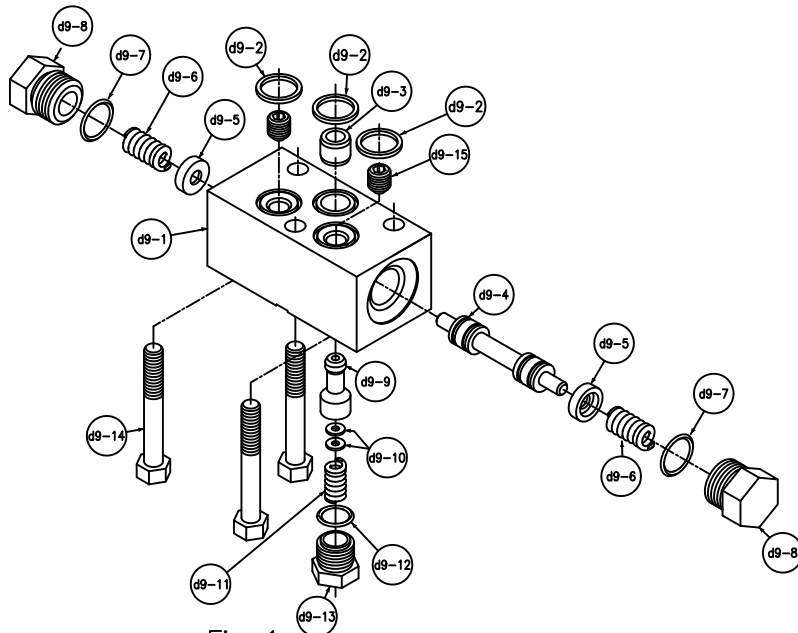
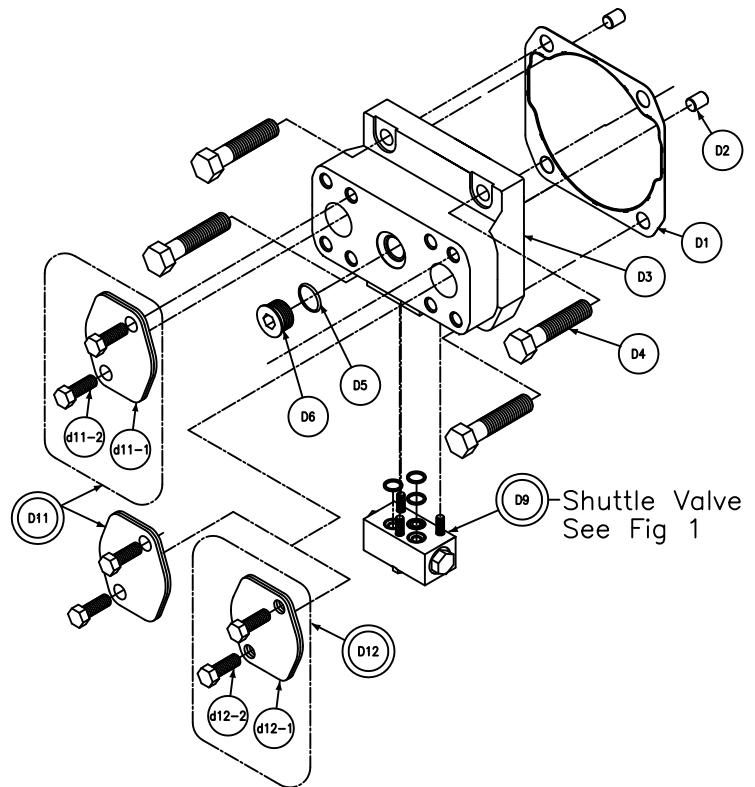


Fig 1
Shuttle Valve (Item D9)



D9 Shuttle Valve
See Fig 1

Section View - D - Type F & G - Port Block Assembly & Associated Kits

Section D P/M6/7/8 F & G Port Block						
Balloon #	Pump/Motor	Type	Seal Code	Item #	Description	Qty
D1	P/M	F/G	**	033-91171-0	GASKET PORT BLOCK	1
D2	P/M	F/G	**	033-70509-0	DOWEL PIN	2
D3	M	F/G	**	033-59991-0	PORT BLOCK WITHOUT SHUTTLE PAD	1
	M	F/G	**	033-59992-0	PORT BLOCK WITHOUT SHUTTLE PAD	
	P	F	**	033-91214-0	PORT BLOCK WITHOUT SHUTTLE PAD	
D4	P/M	F/G	**	306-40181-0	HHCS 5/8-11 UNC x 2 1/2	1
D5	P/M	F/G	1	691-00912-0	O RING	1
			4	694-00912-0		
			5	675-00138-0		
D6	P/M	F/G	**	488-35014-0	PLUG	1
D9	M	G	**	See Kit P/N	HOT OIL SHUTTLE	N/A
	M	G	**	See Kit P/N	HOT OIL SHUTTLE WITH .078 ORIFICES	
	P/M	F	**	N/A	NOT AVAILABLE FOR **F** STYLE PUMPS & MOTORS	
d9-1	M	G	**	033-53117-0	SHUTTLE BODY	1
d9-2	M	G	1	691-10016-0	O RING	3
			4	694-10016-0		
			5	695-10016-0		
d9-3	M	G	**	033-53154-0	SEAT	1
d9-4	M	G	**	033-70529-0	SPOOL	1
d9-5	M	G	**	033-70495-0	WASHER	2
d9-6	M	G	**	033-70515-0	SPRING	2
d9-7	M	G	1	691-00908-0	O RING	2
			4	694-00908-0		
			5	695-00908-0		
d9-8	M	G	**	033-93510-0	PLUG	2
d9-9	M	G	**	033-71925-0	SPOOL	1
d9-10	M	G	**	345-20004-0	SHIM WASHER	2
d9-11	M	G	**	033-71923-0	SPRING	1
d9-12	M	G	1	691-00906-0	O RING	1
			4	694-00906-0		
			5	695-00906-0		
d9-13	M	G	**	033-72129-0	PLUG	1
d9-14	M	G	**	306-40106-0	HHCS 5/16-18 UNC x 2	3
d9-15	M	G	**	033-53523-0	ORIFICE .078	2
D11	M	F/G	**	S13-26133-0	SHIPPING COVER 1 1/2	2
	P	F	**	S13-26133-0	SHIPPING COVER 1 1/2	1
d11-1	P/M	F/G	**	033-71083-0	SHIPPING COVER 1 1/2	1
d11-2	P/M	F/G	**	306-24160-0	HHCS 5/8-11 UNC x 1	2
D-12	P	F	**	S13-09338-0	SHIPPING COVER 1 1/2	1
d12-1	P	F	**	034-70034-0	SHIPPING COVER 2	1
d12-2	P	F	**	306-20120-0	HHCS 1/2-13 UNC x 3/4	2

Shuttle Assembly Kit (without orifices) The following Kit contain items d9-1 thru d9-14			
Pump/Motor	Type	Seal Code	Part Number
M	F/G/M/N	1	S13-48273-0
M	F/G/M/N	4	S13-48273-4
M	F/G/M/N	5	S13-48273-5

Shuttle Assembly Kit (with orifices) The following Kit contain items d9-1 thru d9-15			
Pump/Motor	Type	Seal Code	Part Number
M	F/G/M/N	1	S13-48776-0
M	F/G/M/N	4	N/A
M	F/G/M/N	5	S13-48776-5



Section View - D - Type M & N - Port Block Assembly & Associated Kits

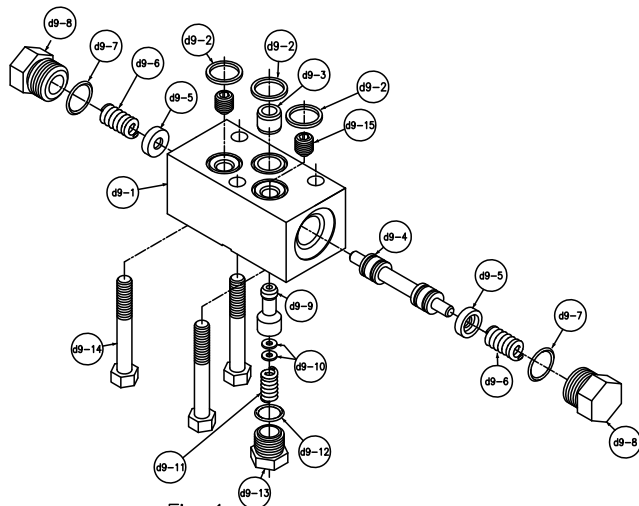
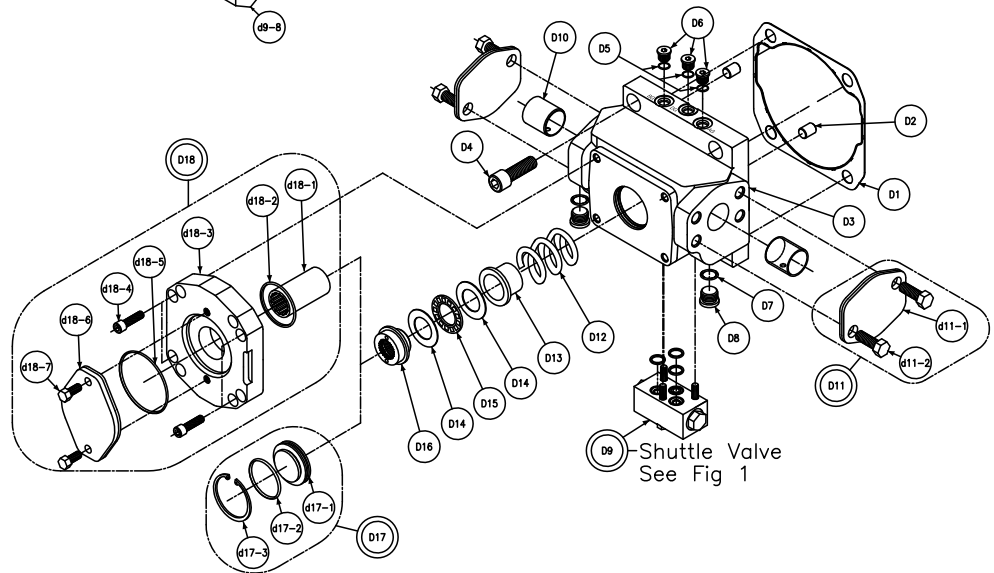


Fig 1
Shuttle Valve (Item D9)

Motor Type
M / N

Pump Type
M



Section D								
P/M6/7/8 Pump & Motor Type M & N Port Block Assembly								
Balloon #	Pump/Motor	Type	Shuttle Valve Features	Seal Code	Item #	Description	Qty	
D1	P/M	M/N	**	**	033-91171-0	GASKET PORT BLOCK	1	
D2	P/M	M/N	**	**	033-70509-0	DOWEL PIN	2	
D3	P/M	M	**	**	033-93711-0	PORT BLOCK W/O SHUTTLE PAD	1	
	M	N			033-93649-0	PORT BLOCK W/ SHUTTLE PAD		
D4	P/M	M/N	**	**	358-24220-0	SHCS 5/8-11 UNC x 1 3/4	4	
D5	P/M	M/N	**	**	1	691-00906-0	GASKET O RING	3
					4	694-00906-0		
					5	695-00906-0		
D6	P/M	M/N	**	**	488-35014-0	PLUG HEX SOC SAE-6	3	
D7	P/M	M/N	**	**	1	691-00910-0	GASKET O RING	2
					4	694-00910-0		
					5	695-00910-0		
D8	P/M	M/N	**	**	488-35055-0	PLUG HEX SOC SAE-10	2	

Continued on next page.



Section View - D - Type M & N - Port Block Assembly & Associated Kits

Section D							
P/M6/7/8 Pump & Motor Type M & N Port Block Assembly							
Balloon #	Pump/Motor	Type	Shuttle Valve Features	Seal Code	Item #	Description	Qty
D9	M	N	00	**	S13-48273-0	ASSY SHUTTLE W/O ORIFICES	1
			02	**	S13-48776-0	ASSY SHUTTLE W/ .078 ORIFICES	
d9-1	M	N	00/02	**	033-53117-0	SHUTTLE BODY	1
d9-2	M	N	00/02	1	691-10016-0	O RING	3
			00/02	4	674-10016-0		
			00/02	5	695-20016-0		
d9-3	M	N	00/02	**	033-53154-0	SEAT	1
d9-4	M	N	00/02	**	033-70529-0	SPOOL	1
d9-5	M	N	00/02	**	033-70495-0	WASHER	2
d9-6	M	N	00/02	**	033-70515-0	SPRING	2
d9-7	M	N	00/02	1	691-00908-0	O ring	2
			00/02	4	674-00908-0		
			00/02	5	695-00908-0		
d9-8	M	N	00/02	**	033-93510-0	PLUG	2
d9-9	M	N	00/02	**	033-71925-0	SPOOL	1
d9-10	M	N	00/02	**	345-20004-0	SHIM WASHER	2
d9-11	M	N	00/02	**	033-71923-0	SPRING	1
d9-12	M	N	00/02	**	691-00906-0	O RING	1
			00/02	**	674-00906-0		
			00/02	**	695-00906-0		
d9-13	M	N	00/02	**	033-72129-0	PLUG	1
d9-14	M	N	00/02	**	306-40106-0	HHCS 5/16-18 UNC x 2	3
d9-15	M	N	02	**	033-53523-0	ORIFICE .078	2
D10	M	M/N	**	**	033-57893-0	SLEEVE SOLID	2
D11	P/M	M/N	**	**	S13-26133-0	ASSY SHIPPING COVER 1 1/2	2
d11-1	P/M	M/N	**	**	033-71083-0	SHIPPING COVER 1 1/2	2
d11-2	P/M	M/N	**	**	306-24160-0	HHCS 5/8-11 UNC x 1	4
D12	P/M	M/N	**	**	033-57400-0	SPRING HOLDDOWN	1
D13	P/M	M/N	**	**	033-57401-0	STOP, HOLDDOWN	1
D14	P/M	M/N	**	**	350-10114-0	WASHER, THRUST_	2
D15	P/M	M/N	**	**	230-82195-0	BEARING, THRUST	1
D16	P/M	M/N	**	**	033-57396-0	NUT, HOLDDOWN	1

M Operating Cover				
Balloon #	Seal Code	Item #	Description	Qty
D17	1	S23-17638-0	ASSY END BLANKING COVER	1
	4	S23-17638-4		
	5	S23-17638-5		
d17-1	**	033-71059-0	COVER BLANKING END	1
d17-2	1	671-00138-0	O RING	1
	4	674-00138-0		
	5	675-00138-0		
d17-3	**	356-65083-0	RING RETAINING	1

Continued on next page.



SAE-A ADAPTOR				
Balloon #	Seal Code	Item #	Description	Qty
D18	1	S23-15868-0	ASSY SAE-A MOUNTING ADAPTER	1
	4	S23-15868-4		
	5	S23-15868-5		
d18-1	**	033-92413-0	SAE-A"COUPLING	1
d18-2	1	671-00138-0	O RING	1
	4	674-00138-0		
	5	675-00138-0		
d18-3	**	033-92412-0	SAE-A ADAPTOR	1
d18-4	**	358-18180-0	HHCS 7/16-14 UNC x 1 1/4	4
d18-5	1	671-00152-0	O RING	1
	4	674-00152-0		
	5	675-00152-0		
d18-6	**	034-59555-0	COVER SHIPPING SAE-A	1
d18-7	**	306-16120-0	HHCS 3/8-16 UNC x 3/4	2

SAE-B ADAPTOR				
Balloon #	Seal Code	Item #	Description	Qty
D18	1	S23-12213-0	ASSY SAE-B MOUNTING ADAPTER	1
	4	S23-12213-4		
	5	S23-12213-5		
d18-1	**	033-57714-0	SAE-A COUPLING	1
d18-2	1	671-00138-0	O RING	1
	4	674-00138-0		
	5	675-00138-0		
d18-3	**	033-57535-0	SAE-B ADAPTOR	1
d18-4	**	358-18200-0	HHCS 7/16-14 UNC x 1 1/2	4
d18-5	1	671-00155-0	O RING	1
	4	674-00155-0		
	5	675-00155-0		
d18-6	**	034-59556-0	COVER SHIPPING SAE-B	1
d18-7	**	306-20120-0	HHCS 1/2-13 UNC x 3/4	2

Section View - D - Type M & N - Port Block Assembly & Associated Kits

SAE-C ADAPTOR				
Balloon #	Seal Code	Item #	Description	Qty
D18	1	S23-12212-0	ASSY SAE-C MOUNTING ADAPTER	1
	4	S23-12212-4		
	5	S23-12212-5		
d18-1	**	033-57398-0	SAE-C COUPLING	1
d18-2	1	671-00138-0	O RING	1
	4	674-00138-0		
	5	675-00138-0		
d18-3	**	033-57395-0	SAE-C ADAPTOR	1
d18-4	**	358-18200-0	HHCS 7/16-14 UNC x 1 1/2	4
d18-5	1	671-00250-0	O RING	1
	4	674-00250-0		
	5	675-00250-0		
d18-6	**	034-59557-0	COVER SHIPPING SAE-C	1
d18-7	**	306-241600-0	HHCS 5/8-11 UNC x 1	2

Shuttle Assembly Kit (without orifices)			
The following kit contains d9-1 thru d9-14			
Pump/Motor	Type	Seal Code	Part Number
M	N	1	S13-48273-0
		4	S13-48273-4
		5	S13-48273-5

Shuttle Assembly Kit (with orifices)			
The following kit contains d9-1 thru d9-14			
Pump/Motor	Type	Seal Code	Part Number
M	N	1	S13-48776-0
		4	S13-48776-4
		5	S13-48776-5

Port Block Assembly Machined for Shuttle Valve Mounting			
The following kit contains Items D3, D5, D6, D7, D8 & D10			
Pump/Motor	Type	Seal Code	Part Number
M	N	1	S23-17612-0

Port Block Assembly Machined without Shuttle Valve Mounting			
The following kit contains Items D3, D5, D6, D7, D8 & D10			
Pump/Motor	Type	Seal Code	Part Number
P/M	M	1	S23-17613-0



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4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of eighteen months from the date of delivery to Buyer. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 60 days after delivery or, in the case of an alleged breach of warranty, within 30 days after the date within the warranty period on which the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for any amount due to Seller from Buyer) must be commenced within thirteen months from the date of tender of delivery by Seller or, for a cause of action based upon an alleged breach of warranty, within thirteen months from the date within the warranty period on which the defect is or should have been discovered by Buyer.

6. LIMITATION OF LIABILITY. UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.

7. Contingencies. Seller shall not be liable for any default or delay in performance if caused by circumstances beyond the reasonable control of Seller.

8. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

9. Loss to Buyer's Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

10. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or

otherwise dispose of any special tooling or other property in its sole discretion at any time.

11. Buyer's Obligation; Rights of Seller. To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest. Seller shall have a security interest in, and lien upon, any property of Buyer in Seller's possession as security for the payment of any amounts owed to Seller by Buyer.

12. Improper Use and Indemnity. Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

13. Cancellations and Changes. Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

14. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

15. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of the agreement. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

16. Waiver and Severability. Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

17. Termination. This agreement may be terminated by Seller for any reason and at any time by giving Buyer thirty (30) days written notice of termination. In addition, Seller may by written notice immediately terminate this agreement for the following: (a) Buyer commits a breach of any provision of this agreement (b) the appointment of a trustee, receiver or custodian for all or any part of Buyer's property (c) the filing of a petition for relief in bankruptcy of the other Party on its own behalf, or by a third party (d) an assignment for the benefit of creditors, or (e) the dissolution or liquidation of the Buyer.

18. Governing Law. This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement. Disputes between the parties shall not be settled by arbitration unless, after a dispute has arisen, both parties expressly agree in writing to arbitrate the dispute.

19. Indemnity for Infringement of Intellectual Property Rights. Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

20. Taxes. Unless otherwise indicated, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of Products.

21. Equal Opportunity Clause. For the performance of government contracts and where dollar value of the Products exceed \$10,000, the equal employment opportunity clauses in Executive Order 11246, VEVRAA, and 41 C.F.R. §§ 60-1.4(a), 60-741.5(a), and 60-250.4, are hereby incorporated.



April 2023

Fixed Displacement Pump options added to M6-7-8 motor catalog HY28-2681-03/GC/US.
Catalog refresh and updated formats



WARNING

The products described in this catalog can expose you to chemicals, including Lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.p65warnings.ca.gov.

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